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Errors in modern Hindu calendar & Hindu festival dates

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Abstract
The paper proves that the current Hindu calendar is incorrect as the dates of Hindu festivals do not follow the actual position of the earth with respect to the sun. The dates of the festivals like Makar Sankranti and Vasant Panchami for example are still aligned with the old tropical calendar that actually needs to be adjusted to sidereal dates.

Keywords: Hindu calendar, Hindu festivals, inaccurate

Introduction
The winter solstice had ended back in December 22nd, 2022 and technically the summer had already started on December 23rd, 2022 with the sun starting to begin it's northward journey. Then why is Lohri and Sankranti celebrated today on January 13th & 14th of 2023 respectively? Why is the Vasant Panchami celebrated on 26th January, 2023 and Holi, 40 days later on March 6th, 2023 when the actual spring does not begin until 14 days after Holi, on 20th March, 2023? Is the Hindu calendar flawed?

Materials and Method
Actually the sun had already started the northward journey back on December 23rd, 2022, the day after the winter solstice on December 22nd, 2022. So we cannot or no longer can call Makar Sankranti the day of Uttarayan, which in sanskrit and Indian scriptures means the beginning of northward journey of the sun. We can still call this as the day when the sun enter's the Makar rashi from Dhanu. The first word signifies the Makar rashi and Sankranti in sanskrit means entering, so the name, the entering of the sun into the Makar or the Capricon rashi is true, Makar Sankranti. There was a time 1700 years ago when the Uttarayan and Makar Sankranti coincided and hence the duality in name. This has happened as the earth changes it's axis by 1 degree every 72 years. So Uttarayan needs to be celebrated on the next day of winter solistice and Makar Sankranti on the day of sun entering the Makar rashi. So the journey of the sun has already begun into the holy next 6 months and this is just the sun entering the holy rashi on Makar Sankranti.
Another mismatch between the Hindu calendar and the real seasonal calendar on earth. Vasant Panchami is on 26th January, 2023, celebrated as the festival for the onset of spring that is supposed to fall 40 days after on the day of Holi, March 6th, 2023. But the actual onset of spring begins 2 weeks after Holi on March 20th, 2023 which is the day of Vernal Equinox or the official first day of spring. The spring equinox defines the real first day of spring on earth as this is the day when the earth is 0 degrees from the sun and -90 degrees from the winter equinox. The day of Vasant Panchami as per the Hindu calendar used to happen exactly 40 days before the beginning of spring when the earth was rotating in a different axis, few centuries back (as earth's axis changes 1 degree every 72 years). This new change has to be accounted in the modern Hindu calendar as the festivals no longer fall on the old dates which used to happen aeons ago.
Following are 3 main inaccuracies or the points of pain described as major flaws in the Hindu calendar:

1. For festivals that depends on the direction of the journey of the sun like Lohri & Makar Sankranti. The sun has already started to move on the northward journey (Uttarayan) from December 23th, 2023 and not on the days of the two festivals above as the original intention.

2. For actual start and end of the seasons that depend on the position of the earth with respect to the sun, for example, the spring beings early on March 8th, 2023 on the Hindu calendar as opposed to the official start of the spring on March 20th, 2023, the day of the vernal equinox.
3. As the spring equinox is defined as the point zero in astronomy (that marks the beginning of the solar year) but the Hindu calendar being mainly lunar has the point zero defined on the first day after Purnima or the full moon in the month of March or Chaitra. This falls on March 8th, 2023 for the calendar year of 2023. This means that the New Year begins on a different date in the Hindu calendar that follows the lunar cycle for the New Year date versus the official point zero, the first day of spring i.e., March 20th, 2023. This defeats the premise behind all the astronomical calculations by the Hindu calendar and makes the calendar fundamentally wrong.

For fixing the point 1 from above, the festival of Makar Sankranti can no longer be called Uttarayan but it does denote the entering of the sun in the Makar rashi. Also, for point 2 in order to keep the vernal seasons in synch with the Hindu lunisolar calendar the dates of Vasant Panchami need to be adjusted 40 days back from the official beginning of spring. So, the actual date of Vasant Panchami in 2023 would have been February 8th, 2023. Also, the festival of Holi needs to adjusted accordingly to being on the March 20th, 2023, the date of the official beginning of spring. The dates of other festivals also need to be adjusted in all the Hindu calendars in use across India to reflect the correct start of the season according to the solar calendar. This is the right thing to do as the solar cycle correctly describes the actual start and end dates of a season and not the lunar cycle and Hindu calendar being lunisolar can be changed easily. The point 3 is the fundamental problem in the Hindu calendar as the new year is based on the lunar cycle and not the solar. Hence all the start and end dates of the lunar months and the subsequent dates of the Hindu festivals are not "actually" correct (as they do not follow the actual start point, the official beginning of the spring or the spring or vernal equinox as the new year). This means that the actual start date of the month of Chaitra should be March 20th, 2023 and not March 8th, 2023. This change will make the Hindu calendar more confusing but correct in the actual sense. If we continue to follow the lunar cycles from new moon to new moon or the full moons then the dates of the Hindu festivals are not "exactly" correct, as the reference point for the new year is with respect to the lunar cycle in the Hindu calendar and not solar. To correct this the new year or the first day of the Chaitra month have to coincide with the solar actual equinox date even though it does not fall a day after the full moon. This will make the calendar confusing to the common people but it will be correct and the dates of the festivals will also fall on the correct dates which will still be according to the lunar cycle.

We have to stay current in the Hindu calendar and the celebration of festivals as we stay current in technology and other areas. Otherwise, we will be celebrating Vasant Panchami when it is actually summer on earth and Makar Sankranti when it is spring. Points 1 and 2 are easy fixes but debate has to happen on point 3 that can initially be confusing but the dates of the festivals will be correct and in synch with the solar and lunar cycles thus making the calendar "truly" lunisolar.

Conclusion

The paper thus proves that the current Hindu calendar is incorrect as the dates of Hindu festivals do not follow the actual position of the earth with respect to the sun and hence not truly lunisolar. Fixes have to be made according to the recommendations provided in this paper otherwise festivals will not "truly" be celebrated. The lunar portion of the calendar is good but the solar portion needs to be corrected to be truly called the Hindu calendar or पञ्चाङ्ग.

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